OWNER'S MANUAL

Polaris Watermatic

C1500 ORP or pH Controller

120V/240V

IMPORTANT SAFETY INFORMATION

When installing and using this electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

Installation of this equipment should be performed by a licensed electrician and conform to all National Electric Code (NEC), state and local codes. Installations in Canada must comply to CEC requirements.

WARNING: To reduce the risk of electrical shock:

- Turn off or disconnect the power source before installing, opening the door, or adjusting the internal workings of the controller.
- Install all electrical equipment at least 10 feet (3 m) from inside wall of pool or spa.
- Connect this device only to a grounding-type receptacle protected by a ground-fault circuit interrupter (GFCI).
- Do not use an extension cord, connect the controller directly into the outlet. Do not bury the cord.

WARNING: To reduce risk of injury, do not permit children to use this product unless they are closely supervised at all times.

For proper operation, it is imperative that the system has proper flow past the sensors when the pool filtration system is running.

When automating a body of water, size the feeders so desired levels can be attained in short operating cycles. If feeders are unable to keep up with demand within a short time frame, automation becomes ineffective.

Always test and adjust sanitizer and pH to acceptable levels before activating a new system. Automated chemical controllers are designed to maintain water chemistry, not balance the pool.

While the system is feeding, inaccurate sanitizer/pH levels may be displayed because the system is still circulating the chemical.

Observe precautions for electrostatic sensitive devices.

SAVE THESE INSTRUCTIONS.

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Specifications

pH Control Range:	7.0 to 8.0
ORP Control Range:	200 to 900
Input Power:	• 120 VAC 50/60 Hz, GFCI source required • 240 VAC 50/60 Hz capable • 8A fuse for 120V, 4A fuse for 240V
Controller Power:	Less than .5 amp internally fused
Output Power:	• 120 VAC 50/60 Hz • 240 VAC 50/60 Hz capable • 8A fuse for 120V, 4A fuse for 240V
Display:	LCD, 2-line character display
Operating Temp:	40 - 120° F
Sensors:	• pH: glass combination with 10' cable • ORP: platinum combination with 10' cable
Inputs:	ORP & pH sensors; BNC connectors Flow detection
Outputs:	• ORP/pH Feeder - High Voltage 120 VAC 50/60 Hz (with 120V input) 240 VAC 50/60 Hz (with 240V input) 8A fuse for 120, 4A fuse for 240 on-board • ORP/pH Feeder – Low Voltage, 24V

Introduction

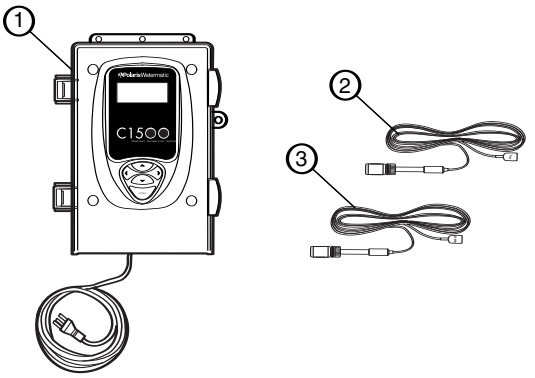
Congratulations on the purchase of your new ORP/pH controller and thank you for choosing Polaris. The Polaris Watermatic C1500 Controller automatically monitors and maintains either the sanitizer level or the pH balance in swimming pools, spas, or any circulating water system that requires water chemistry management. Designed for easy installation and simple operation, it can be used with liquid feed pumps, granular feeders, tablet erosion feeders, and ozone generators. It is not warranted or recommended for use with chlorine gas systems.

During the filtration cycle, the controller maintains sanitizer levels or pH balance by constantly measuring the Oxidation-Reduction-Potential (ORP) and pH balance of the water. If the sanitizer level (ORP) or pH falls below a predetermined set point, the controller activates the chemical feeder.

Settings and measurements are displayed on an easy-to-read LCD text screen and adjustments are made via a touch key pad.

Watermatic C1500 Components

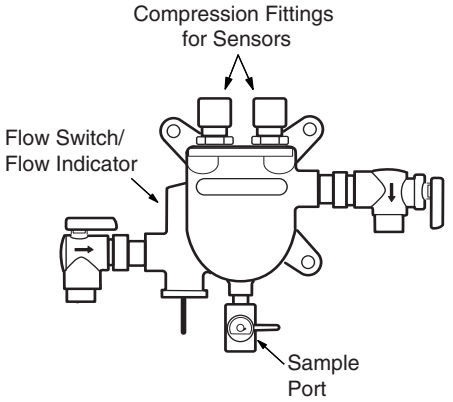
1. C1500 ORP/pH Controller
2. ORP Sensor
3. pH Sensor



Optional Flow Cell/Flow Switch Assembly

The flow cell houses the sensors and provides a sample port for manual testing. It also contains an integrated flow switch/flow indicator that prevents the feeder from feeding if there is insufficient flow. If flow is insufficient, a warning message will appear on the screen.

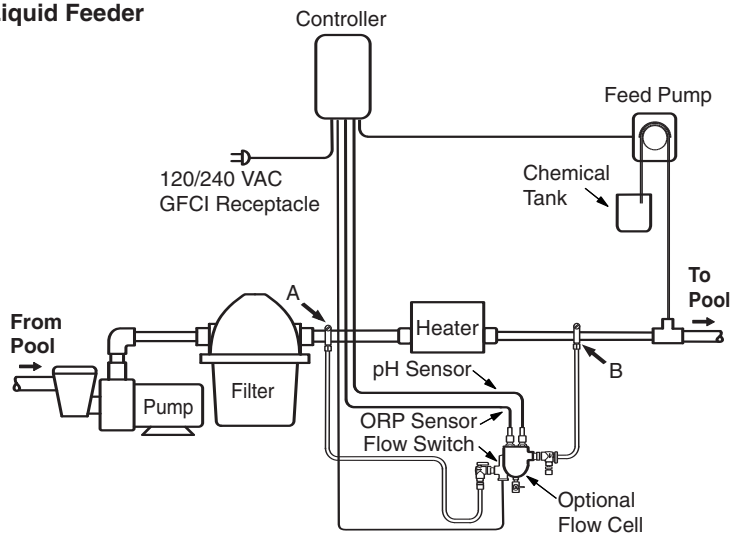
Contact an authorized Polaris dealer to order, part #9-700.



Installation

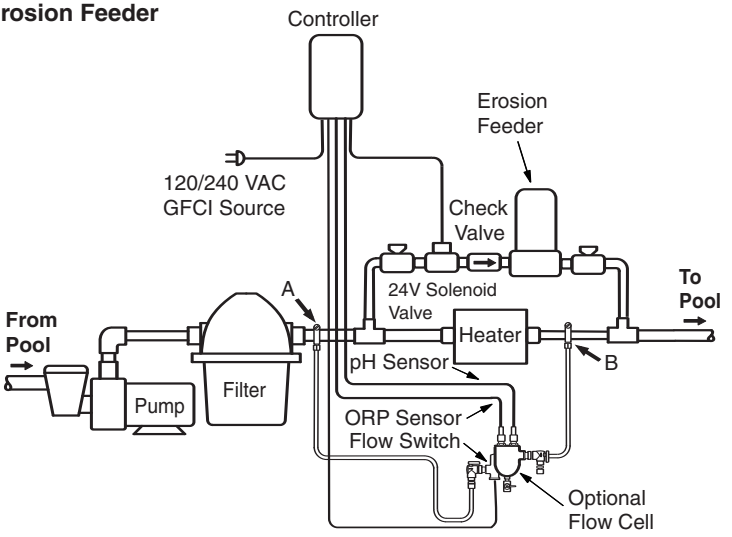
Install the chemical pump and erosion feed systems as shown. If the model differs from these systems, refer to the installation manual provided with it for the appropriate installation methods.

Liquid Feeder

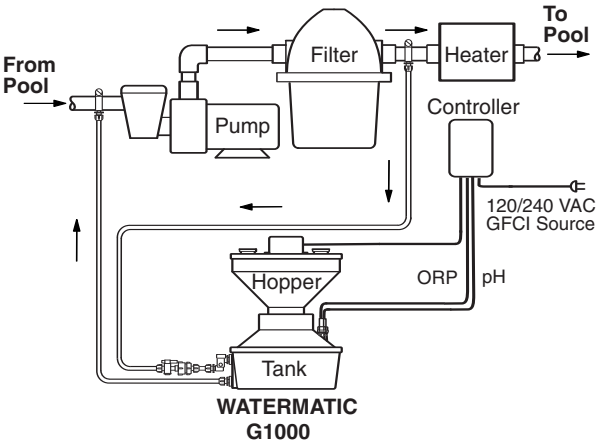


If using an acid feed system, the insertion point must be down stream of all equipment.

Erosion Feeder



Granular Feeder



Do not install granular feeders below the pool water level.

Controller Installation

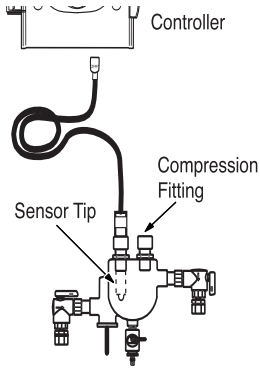
Before installing the controller, do a site assessment to consider where and how you will mount the unit. The controller should be mounted on a wall or other flat surface within eight feet of the feeder, at least ten feet away from the edge of the water and within six feet of the GFCI power source. Use mounting screws or anchors to mount the controller.

Sensor Installation

Unpack the sensors and remove the protective bottle and o-rings. Set aside the o-rings. Save the bottles for winterizing or reshipping.

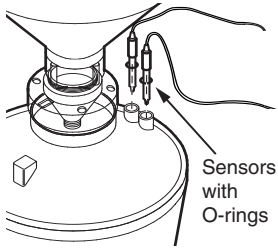
Flow Cell

Remove the compression fitting nut from the flow cell and slide it up onto the sensor. Slide o-ring from the bottle onto the sensor. Insert the sensor into the compression fitting on the flow cell assembly. The sensor tip should extend below the water line in the flow cell.



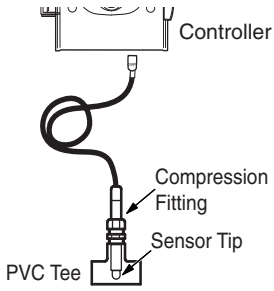
Granular Feeder

Insert the sensors with the o-rings into the holes on the feeder tank. The sensor tips should be covered with at least 1" of water.



In-line

Install 1/2" female threaded PVC tee into the return line. Screw the compression fitting into the tee. Slide an o-ring onto the sensor. Insert sensor with o-ring into the fitting. Sensor tip should be below the water line in the pipe.

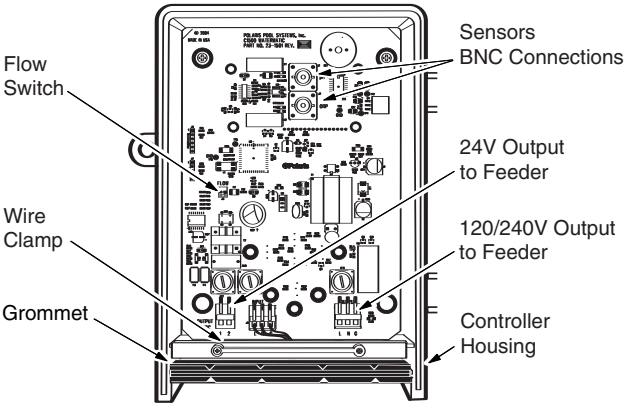


Hand-tighten the nuts of the compression fittings, do not use a wrench. Route sensor cables to the controller, coiling extra cable externally, not in the controller box.

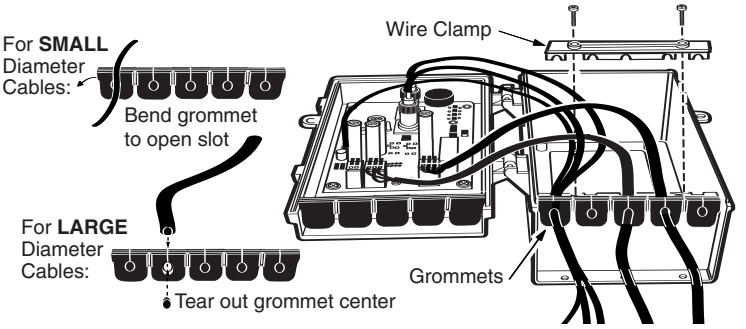
Electrical Connections

To complete electrical connects:

1. Ensure power is disconnected. Open the controller door.



2. Remove the wire clamp.
3. Strip wire leads (maximum of 3/8") from ORP and pH feeders. To facilitate wire hook-up, remove output terminal block from circuit board. Attach feeder AC output leads to terminal block. Note the orientation of the leads (ground, line and neutral). Reinstall terminal block.
4. If using a Flow Cell, remove the jumper on the Flow terminal block and attach leads from the Flow Switch to the terminal.
5. Attach the pH and ORP sensor BNC connectors to the board.
6. Route connections through housing grommets using the appropriate grommet for the wire size.



7. Reinstall wire clamp and close the door.

Operation

System Startup

Do not add chemicals to the feeder until completing the following startup operations.

1. Use a DPD test kit and fresh phenol red solution to test the water's sanitizer level and pH, then manually adjust the water to acceptable levels.
2. With the controller power off, turn on the filter pump to check for leaks and proper flow.
3. Plug controller power cord into GFCI receptacle. The LCD display screen should illuminate.
3. Review controller displays and set the controller functions. Adjust the defaults, if necessary, to match the application.

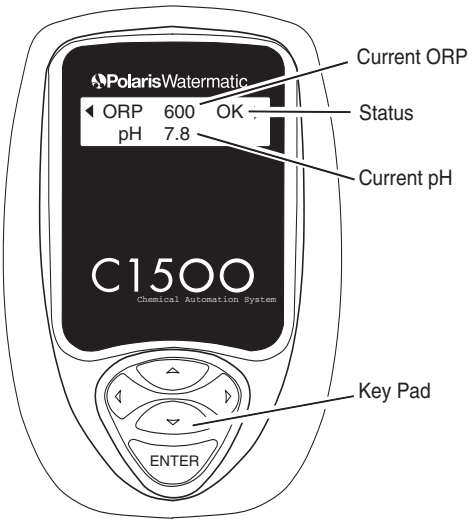
Controller Displays

ORP and pH measurements and settings are displayed on the controller's LCD screen. Adjustments to settings are made with the key pad. Use the left and right arrow keys to move through the screens and the up or down keys to adjust the settings.

Main Screen

The Main screen shows the current ORP and pH readings, and a status message.

The status messages are: "**Feeding**" when chemical is being dispensed, "**OK**" when sensor readings match the desired levels, no display or **blank** during a feed delay cycle or an **alert** notice.



Feed ORP or pH

Configures the controller as either an ORP feeder or a pH feeder. Only one may be selected.

Feeder Type

Specifies the type of feeder being used. Depending on the feeder selected, Feed Time and Feed Delay settings will change to the feeder specific defaults outlined in the Appendix.

Types of feeders available:

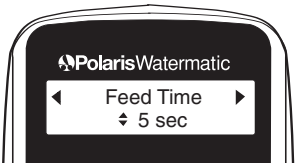
- Granular
- Liquid (Use for Ozone generators)
- Erosion HP (line voltage) solenoid
- Erosion LP (24V) solenoid

Acid/Base

Displayed only if ”Feed pH” is chosen. Designates whether the controller maintains the pH below the set point (acid) or above the set point (base).

Feed Time

Designates the amount of time the feeder is activated. The preset defaults for specific feeder types (see Appendix) can be adjusted as necessary.

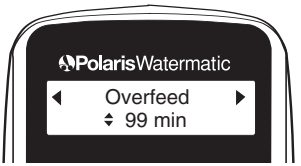


Feed Delay

Designates a minimum time between feeding. This option is not displayed if “Continuous” feed is selected. All feeders default to 10 minutes but can be adjusted from 1-99 minutes.

Overfeed

Displays only when Feed Time is set to "Continuous." Sets a maximum feed time to prevent overfeeding caused by an empty chemical tank or tubing leak. Defaults to 99 minutes, but is selectable from 1-99 minutes.



Manual Feed

Activates either the ORP or pH feeder to facilitate testing of connections and feed cycles.

To manually feed, press the <Enter> key.

When manually feeding, the Main screen will display a “feeding” status message.

Audible Alarm

Toggles the controller’s internal audible alarm on or off.

The alarm sounds and an alert message is displayed on the screen for the following circumstances:

High Alert - When ORP is above 900 or pH is above 8.0 for ten consecutive minutes.

Low Alert - When ORP is below 200 or pH below 7.0 for ten consecutive minutes.

When the alert condition is corrected, the controller will wait ten minutes then automatically clear the alert. After a two-minute delay, it will activate the feeder as needed.

If a flow cell/flow switch is installed and there is insufficient flow over the sensors, a **No Flow** alert will be signaled on the screen.

ORP or PH Setpoint

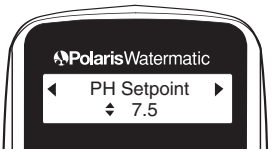
Designates the desired level of sanitizer (ORP) or pH depending on feeding system.

Feed ORP

Set ORP to any value between 200 and 800, in increments of 10. The default is 600.

Feed pH

Set pH to any value between 7.0 and 8.2, in increments of 0.1 pH. The default is 7.5.



The controller displays direct ORP readings and the control is based on this reading, not parts per million (ppm). While ORP indicates the effectiveness of the sanitizer, it does not directly correlate to a ppm reading. Use a DPD test kit to measure the free chlorine. If you need more or less sanitizer, adjust the set point up or down accordingly.

Note: The ORP reading is not linear. An adjustment from 700 to 750 could increase the sanitizer level by several ppm. The World Health Organization suggests maintaining an ORP at or above 650.

Calibration

Allows user to adjust the pH sensor reading to match the actual pH of the water.

To calibrate the pH, check the pH of the water at the probe location using a high-quality manual test kit with fresh phenol red solution. If the pH reading on screen is different than the actual, use the up/down curser to select the proper pH. Press <Enter> to save the entry. Using the left/right arrow key, return to the Main screen and verify that pH displays accurately.

System Operation

When system setup is complete:

1. Fill feeder with chemical.
2. Turn on the pool circulation system. A 2-minute delay at startup allows air to be purged from the feeders and the sensors to stabilize.
3. Manually feed one cycle to ensure proper operation. ORP or pH feed messages (“Feeding,” “OK,” blank or an alert) will display under Status.
4. Allow the system to operate for a few days. With the filtration system running, retest the levels and adjust the set points if necessary.

To place the controller in **Standby Mode** (disables feeder control, sensing, etc. but power is still on) press and hold the <Enter> key for five seconds. Press any key to reactivate.

To service the controller, unplug the controller to disconnect the power.

Maintenance

Cleaning the Sensor Tips

Clean the sensor tips once a month to ensure accurate readings. When dirty, the sensors can read a lower than actual sanitizer/pH level and can cause too much sanitizer/pH to be dispensed.

Note: A sensor tip coated with calcium scale will not look dirty.

To clean the sensor tip.

1. Turn off the controller. Turn off the filtration system or close the valves to isolate the sensor.
2. Remove the sensor from the compression fitting.
3. Swirl the tip for five seconds in muriatic acid (diluted 5 to 1) or white vinegar and rinse it in water. Do not touch, wipe or brush the end of the sensor. For commercial pools and spas, every third cleaning, swirl the sensor tip in a solution of liquid soap and water. Rinse with water.
4. Reinstall the sensor and turn on the controller.
5. Allow the controller to operate for a few minutes to get an accurate reading. Adjust the setting if necessary.

Checking the ORP Sensor

The ORP sensor should be checked every six months or anytime the feeder oversanitizes the water.

1. Clean the sensor tip.
2. Put the sensor in a clean glass of tap water. This should give a reading of between 200 and 400. Adding a pinch of Dichlor or Trichlor should cause the ORP level to jump to between 750 and 800. If Dichlor or Trichlor are not available and a sanitizer with a high pH such as calcium hypochlorite or liquid chlorine (sodium hypochlorite) is used, the ORP level may only rise to between 650 and 750.
3. If the sensor does not respond as indicated, the sensor should be replaced.

Checking the pH Sensor

The pH sensor should be checked every six months or anytime the pH goes out of range.

1. Clean the sensor.
2. Place the sensor in a clean glass of tap water. Add a small amount of acid to the glass. The pH reading should drop. Place the sensor in any solution with a pH above 7.5. The pH reading should rise.
3. If the sensor does not respond as indicated, the sensor should be replaced.

Winterizing

If the system is subject to extended shutdowns or is located in colder climates, it is important to winterize the system.

1. Turn off the main power to the controller.
2. Gently remove the sensors and store them in a protective cap or bottle filled with a liquid solution of one teaspoon salt and three teaspoons water. Mix the solution thoroughly and make sure the solution completely covers the tip of the sensors. Store the sensors in a warm place. Do not expose sensors to freezing temperatures.
3. If installed, drain the water from the flow cell/flow switch.

Warranty

Polaris Watermatic C1500 ORP or pH Controller

This limited warranty is extended to the original consumer purchaser of this Polaris Watermatic Controller manufactured by Polaris Pool Systems, Inc. ("Polaris"), 2620 Commerce Way, Vista, CA 92081-8438, USA.

Polaris warrants the Watermatic Controller, including all parts and components thereof, to be free of defects in material and workmanship. For questions regarding your Polaris Watermatic Controller, please call or write us. Be sure to provide the serial number of your unit.

The warranty commences on the date of installation of the controller and shall remain in effect for a period of one (1) year from the date of purchase as established by proof of purchase or two (2) years from the date of manufacture of the controller as established by the serial number, whichever is earlier.

This limited warranty does not apply if the failure is caused or contributed by any of the following: improper handling, improper storage, abuse, unsuitable application of the unit, lack of reasonable and necessary maintenance, winter freezing or repairs made or attempted by other than Polaris or one of its Authorized Service Centers. Polaris will repair or replace, at its option, a unit, part or component proved to be defective within the warranty period and under the conditions of the warranty.

Unless local repair is authorized, the consumer must deliver or ship the unit or the warranted parts or components, freight prepaid to the nearest Polaris Authorized Service Center or return it freight prepaid (after proper authorization) to the plant of manufacture. Authorization to return a unit to the plant of manufacture must be obtained from the Polaris Customer Service Department. For your convenience, please check with your dealer for the local procedure before exercising this warranty. If further directions or instructions should be required, contact the Customer Service Department at 1-800-VAC-SWEEP (USA and Canada only) or 760-599-9600. Be sure to insure your shipments against loss or damage during transit.

Polaris is not responsible for the cost of removal of the unit, damages occurring during removal or due to removal, any other expenses incurred in shipping the unit or parts to or from the factory or its Authorized Service Centers, or the installation of the repaired or replacement unit. The consumer must bear these expenses. This warranty does not cover repair of a unit except at our factory or a Polaris Authorized Service Center.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS LIMITED WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL SUCH OTHER WARRANTIES ARE DISCLAIMED EXCEPT TO THE EXTENT ANY IMPLIED WARRANTY MAY BE IMPOSED BY STATE CONSUMER LAW. ANY SUCH IMPLIED WARRANTY IMPOSED BY STATE CONSUMER LAW IS LIMITED IN DURATION TO ONE (1) YEAR FROM DATE OF PURCHASE. IN NO EVENT SHALL POLARIS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE OR KIND OR FOR DAMAGES TO PERSONS OR PROPERTY, INCLUDING ANY DAMAGE RESULTING FROM THE USE OF THE POLARIS WATERMATIC CONTROLLER. THE ONLY REMEDY PROVIDED TO YOU UNDER AN APPLICABLE IMPLIED WARRANTY AND THE LIMITED WARRANTY SET FORTH ABOVE SHALL BE THE REMEDIES EXPRESSLY PROVIDED FOR UNDER THIS LIMITED WARRANTY.

This limited warranty gives you specific legal rights. You may also have other rights that may vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

This limited warranty is valid only in the United States of America and Canada, and it does not apply to Polaris Watermatic Controllers sold or installed in any other country.

Appendix

Feed Times and Delay Times

When the ORP or pH feeder type is specified during setup, the Feed Time and Delay Time settings change to the feeder specific defaults listed below. The options listed are available to customize for the specific application.

After allowing the system to run for a few days, adjust the ORP or pH settings as needed. Lengthen the feed cycle if the water is undersanitized or shorten it if the water is oversanitized. Shorten the delay time if the feeder cannot keep up with demand.

Granular Feeder

	Feed Time	Delay Time (Min.)	Overfeed (Min.)
Options	0.5, 1, 2, 3, 4, 5 Sec.	1 – 99	N/A
Defaults	5 Sec.	10	

Liquid Feeder (Use for ozone generators)

	Feed Time	Delay Time (Min.)	Overfeed (Min.)
Options	Continuous	Off	1 - 99
	5, 10, 15, 20, 30 Sec. 1, 2, 3, 4, 5, 10, 15 Min.	1 - 99	Off
Defaults	10 Min.	10	Off

Erosion Feeder

	Feed Time	Delay Time (Min.)	Overfeed (Min.)
Options:	Continuous	Off	1 - 99
	5, 10, 15, 20, 30 Sec. 1, 2, 3, 4, 5, 10, 15 Min.	1 - 99	Off
Default	10 Min	10	Off

Erosion LP = Low power (24V) solenoid
Erosion HP = High power (line voltage) solenoid

Alerts and Alarms

The following alert conditions **will** sound the audible alarm:

- High PH Alert
- Low PH Alert
- High ORP Alert
- Low ORP Alert
- PH Overfeed
- ORP Overfeed

The following alert conditions **will not** sound the Alarm:

- No Flow
- 2-Minute Flow Delay

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